## REMARKS

The Office Action dated December 9, 2004 has been carefully considered. Claims 14, 21 and 25 have been amended. Claims 14-25 are in this application.

Support for the amendments to claims 14 and 25 are found throughout the specification and in particular at Example 1, Example 4 and table 1 and paragraph [0031] of the published application. Support for the amendment to claim 21 is found throughout the specification and in particular at paragraph [0022] of the published application.

Previously presented claims 14, 16, and 21 were rejected under 35 U.S.C. § 102 as being anticipated by GB 2 117 172 A to Bodendore. Applicant submits that the teachings of this reference does not teach or suggest the invention defined by the present claims.

Bodendore discloses a battery separator including diatomaceous earth filler, acrylate copolymer binders and fibers. The fibers are made of polyolefin, polyester and glass. The fibers have a length of from about ¼ inch (about 6.2 mm) to about ¾ inch (about 19.1 mm).

In contrast to the invention defined by the present claims, Bodendore does not teach or suggest a hot melt adhesive. Applicant submits that hot melt adhesives are solvent-free adhesives which are solid at room temperature and can adhere to a subject when it is heated to a certain temperature and under a pressure. Examples of hot melt adhesives include ethylene vinyl acetate copolymers, and ethylene ethyl acrylate copolymers, *i.e.* poly(ethylene-ethyl acrylate) as described in paragraph [0016]-[0018] of the published application. Only the copolymer product between ethylene and (ethyl) acrylate, namely ethylene (ethyl) acylate copolymer is considered as a type of hot melt adhesives. In contrast, "acrylate copolymer" is not considered a hot melt adhesive because acrylate copolymer could be a plastic or a rubber, a solid or a liquid, depending on the nature of other comonomer. Further, Bodendore does not teach or suggest engineering plastics and that the hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. In contrast, Bodendore teaches a fiber made of polyolefin, polyester and glass having a length of at least ¼ inch long which will not result in a microporous membrane having a hot-melt adhesive and engineering plastic which is homogenous and uniformly distributed. Accordingly, the invention defined by the present claims is not anticipated by Bodendore.

The previously presented claims were rejected under 35 U.S.C. § 103 as obvious in view of Shinomura or Shinomura in combination with U.S. Patent No. 5,928,812 to Xue, U.S. Patent No. 5,846,673 to Saidi, U.S. Patent No. 3,689,334 to Dermody, EP '796, U.S. Patent No. 4,085,241 to Sheibley and U.S. Patent No. 4,985,317 to Adachi.

Shinomura disclose a process for preparing a permeable membrane which comprises mixing in the molten state two different kinds of thermoplastic resins. Fillers, such as fibrous materials, antioxidants and plasticizers can be added to the two resins. The sheet is treated with a solvent which is a good solvent for one of the resins, but is a poor solvent for the other resin, in order to dissolve and remove the soluble resin.

In contrast to the invention defined by the present claims, Shinomura does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. Rather, Shinomura is directed to selection of resins having different solubility in a solvent. There is no teaching or suggestion in Shinomura that the produced microporous membrane will have the features of being uniform, homogenous and mechanically strong as the microporous membrane of the present invention. Further, Shinomura does not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Accordingly, the invention defined by the present claims is not obvious in view of Shinomura.

Sheibley discloses a method of making porous separator for alkaline battery by coating a slurry onto a porous substrate such as asbestos. The slurry is prepared by dissolving in a solvent a thermoplastic rubber, filler, and additives. The resulting membrane has various compositions e.g. on top, bottom and middle section of the membrane.

In contrast to the invention defined by the present claims, Sheibley does not teach or suggest a homogenous membrane. Rather, Sheibley teaches a membrane having various compositions on different sections of the membranes. Further, Sheibley does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. Further still, Sheibley does not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Accordingly, Sheibley does not cure the deficiencies of

Shinomura described above.

Xue discloses rechargeable lithium ion containing cells having improved shelf life. A non-cathode active lithium compound insoluble in the non-aqueous electrolyte of the cell is dispersed through the cathode and is further dispersed within at least one of the anode and separator. A binding polymer used in the electrodes and separator is a thermoplastic polymer preferably hexafluoropropylene or PVdF-HFP.

In contrast to the invention defined by the present claims, Xue does not teach anything about a battery made with a separator comprising a hot-melt adhesive and engineering plastics. Further, Xue does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. Further still, Xue does not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Thus, Xue does not cure the deficiencies of Shinomura described above.

Saidi et al. disclose providing a composition to stabilize an electrochemical cell. The compound is an additive of an organic amine.

In contrast to the invention defined by the present claims, Saidi et al. do not teach anything about a battery made with a separator comprising a hot-melt adhesive and engineering plastics. In addition, Saidi et al. do not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. Further, Saidi et al. do not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Accordingly, Saidi et al. do not cure the deficiencies of Shinomura described above.

With regard to claim 25, claim 25 recites hydrocarbon resin. Neither Xue nor Saidi et al. teach a hydrocarbon resin for use as a tackifier or binding material. Furthermore, Applicant submits that one of ordinary skill in the art would not make the battery separator of the present claims by combining the teachings of Shinomura, Sheibley, Xue and Saidi et al. and it is only in hindsight that these references are cited.

Dermody discloses a method of bonding metal to polymers with an adhesive. The adhesive comprises an olefin interpolymer of a monomer of ethylene or propylene and a

comonomer of vinyl alkanoates and alkyl esters of acrylic acid and methacrylic acid.

In contrast to the present invention defined by the present claims, Dermody does not teach anything about a battery made with a separator comprising a hot-melt adhesive and engineering plastics. Further, Dermody does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. In addition, Dermody does not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Accordingly, Dermondy does not cure the deficiencies of Shinomura described above.

EP '796 discloses lithium-ion battery comprising a separator which is made by applying an adhesive resin on a separator layer. Namely, the resulting separator has at least three layers: top layer of adhesive resin, center layer of separator, and bottom layer of adhesive resin.

In contrast to the invention defined by the present claims EP '796 does not teach or suggest a homogenous membrane. Instead, EP '796 teaches away from the present invention by teaching a plurality of layers. Furthermore, EP '796 does not teach anything about a battery made with a separator comprising a hot-melt adhesive and engineering plastics. Rather, EP '796 teaches an adhesive resin. Applicant points out that an adhesive resin is different from the hot-melt adhesive, the former can adhere to a subject at room temperature, while latter can adhere only when it is in a hot state, namely it needs to be heated up to a high temperature, usually at 100-200° C). In addition, EP '796 does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane, nor does EP '796 teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Thus, EP '796 does not cure the deficiencies of the references cited above.

Applicant submits that one of ordinary skill in the art would not make the battery separator of the present claims by combining the teachings of Shinomura, Sheibley, Xue and Saidi et al., and EP '796 and it is only in hindsight that the references can be cited.

Adachi discloses a lithium ion-conductive solid electrolyte containing lithium titanium phosphate comprising a., a solid electrolyte of powder and b., an insulating elastomer.

In contrast to the invention defined by the present claims, Adachi does not teach anything

about a battery made with a separator comprising a hot-melt adhesive and engineering plastics. Rather, Adachi is directed to a solid electrolyte sheet which is not a microporous membrane. Further, Adachi does not teach or suggest that a hot-melt adhesive, engineering plastics and filler are distributed evenly and uniformly in a microporous membrane. In addition, Adachi does not teach or suggest that the microporous membrane is bound permanently onto the surface of at least one positive electrode or at least one negative electrode. Thus, Adachi does not cure the deficiencies of Shinomura described above.

In view of the foregoing, Applicant submits that all pending claims are in condition for allowance and request that all claims be allowed. The Examiner is invited to contact the undersigned should he believe that this would expedite prosecution of this application. It is believed that no fee is required. The Commissioner is authorized to charge any deficiency or credit any overpayment to Deposit Account No. 13-2165.

Respectfully submitted,

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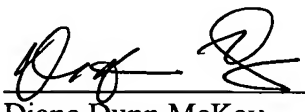

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